

Supply-side predictors of fatal drug overdose in the Washington/Baltimore HIDTA region: 2016–2020

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Abstract

Background

Rising rates of fentanyl- and polydrug-involved drug overdose deaths have prompted inquiry into the role of drug supply in fatal overdose outcomes in the United States. To date, however, there have been few empirical investigations of drug enforcement strategies on fatal overdose rates, despite knowledge that both drug use and supply are often geographically distributed. To address this limitation, we examined measures of drug enforcement as predictors of next-year fatal overdose rates in the Washington/Baltimore High Intensity Drug Trafficking Area (W/B HIDTA).

Methods

We conducted mixed-effects models to examine the role of drug seizures and disruption in drug trafficking organizations (DTOs) and money laundering organizations (MLOs) on fatal overdose rates over a 5-year period (2016–2020) across 45 local jurisdictions in the W/B HIDTA region. Outcomes included any, opioid-involved, and fentanyl-involved fatal overdose.

Results

Adjusting for covariates, both the total number of drug seizures and amount of cocaine seized (in dosage units per capita) positively predicted next-year opioid- and fentanyl-involved fatal overdose rates. Disruption to DTO and MLO operations did not significantly predict next-year fatal overdose rates for any outcome.

Conclusion

Supply-side enforcement activities alone may have limited impact on reducing fatal overdose rates, but may serve as important markers to identify communities at high risk of fatal overdose and facilitate targeted intervention. Our findings underscore the importance of comprehensive law enforcement approaches that extend beyond drug enforcement to integrate prevention, linkage to treatment, and harm reduction strategies as needed to address the overdose epidemic.

Introduction

Rates of fatal drug overdose in the United States (U.S.) rose rapidly in 2020 to 28 deaths per 100,000 residents, representing a 31% increase in the age-adjusted rate over 2019 (Hedegaard & Warner, 2021). Provisional data from the Centers for Disease Control and Prevention suggest 2021

will reflect another record year of drug overdose deaths (National Center for Health Statistics, 2022). High rates of drug overdose deaths in recent years have been driven by a growing presence of illicitly manufactured fentanyl in the U.S. drug supply (O'Donnell et al., 2021). Fentanyl-involved fatal overdose rates increased 56% between 2019 and 2020 (Hedegaard & Warner, 2021). Some scholars have argued the U.S. is moving into a fourth wave of the opioid epidemic, characterized by unintentional polysubstance use (i.e., drugs manufactured with illicit fentanyl) and growing stimulant involvement in overdose deaths (Ciccarone, 2021; O'Donnell et al., 2021). Over 40% of drug overdose deaths in 2020 involved a stimulant, and illicitly manufactured fentanyl was more likely to co-occur in stimulant-involved deaths than other opioid-involved deaths (O'Donnell et al., 2021).

Many connect the growing lethality of the U.S. illicit drug supply to the country's longstanding and heavy focus on supply-side reduction via drug prohibition and law enforcement (Werb, 2018). In 1979, Richard Nixon first declared the “War on Drugs,” heralded by the passing of the Controlled Substance Act in 1971. Between 1981 and 1998, federal funding for drug enforcement grew over 1000% to \$10.7 billion in 1998 (Drucker, 1999). Evidence suggests the harsh penalties associated with the “War on Drugs” created broader structural inequalities that now drive drug use (Cohen et al., 2022; Uzwiak et al., 2021), the adverse effects of which have disproportionately impacted people of color (Provine, 2011). Moreover, as evidence has emerged on the effectiveness of prevention, treatment, and harm reduction approaches to illicit drug use (NIDA, 2019; O'Connor et al., 2020; Ritter & Cameron, 2006), shifting political tides have made it difficult to advance a uniform approach to funding drug treatment and prevention as part of national drug control policy (Gottschalk, 2023; McLean, 2018).

Today, supply-side drug enforcement strategies are increasingly implemented together with demand-side reduction strategies (i.e., treatment, prevention, and harm reduction; McLean, 2018). The nation's top drug enforcement agency, the Office of the National Drug Control Policy (ONDCP), views substance use both as illicit activity but also through a public health lens (Sacco & Finklea, 2018). In fact, federal spending for treatment and prevention through the ONDCP increased nearly 140% in recent years, from \$9.16 billion in expenditures in 2013 to a \$21.8 billion operational budget in 2022 (ONDCP, 2022; Sacco & Finklea, 2018). Funding for treatment and prevention currently constitutes 55.6% of the ONDCP budget (ONDCP, 2022). Despite the considerable growth in funding for demand reduction, many argue that these efforts remain underfunded (Gottschalk, 2023) and fail to address socioeconomic factors that predispose people to substance use (Flores et al., 2020). Further, some argue that continued heavy investment in drug law enforcement impedes the success of demand reduction efforts (Cohen et al., 2022; Werb, 2018).

Reducing drug supply remains a central focus of national drug policy, as evidenced by the ONDCP's nearly \$17.5 billion budget for supply reduction in 2022 (ONDCP, 2022). Prior research suggests these activities may have the greatest impact on reducing community harms associated with illicit drug markets, such as violence (Strang et al., 2012). Law enforcement may also affect drug markets via pricing, with evidence suggesting that higher prices can curtail drug use (Strang et al., 2012). However, evidence is more limited on whether law enforcement strategies to disrupt drug supply or organization of drug markets can reduce drug use (Werb, 2018). Opioids, especially heroin and fentanyl, may be the most difficult drug markets to disrupt due to the

widespread nature of the networks (Stern et al., 2021), with drug market disruptions causing suppliers and individuals to turn to more lethal drugs, such as fentanyl (Werb, 2018).

Historically, much of the research on supply-side enforcement has focused on the impact of drug seizures on illicit drug use and associated outcomes. An early study examined whether heroin seizures meaningfully reduced drug supply or use (Wood et al., 2003), finding that the heroin drug supply was replaced by other suppliers following a seizure. Other studies have shown a connection between heroin supply and fatal overdose deaths, finding that reduced heroin supply was associated with more polydrug use deaths (Degenhardt et al., 2005). However, this study examined time-based trends and did not control for other factors that may have affected fatal overdose rates. A systematic review of four drug seizure studies found conflicting evidence on whether drug seizures had measurable effects on drug supply or accessibility and fatal overdose deaths, with most studies suggesting null effects (Mazerolle et al., 2007).

More recent investigations have found evidence that drug seizures are linked to increases in overdose rates. In one study, researchers temporally and spatially linked drug seizures to rates of non-fatal overdose, finding that seizures were linked to non-fatal overdoses occurring within three weeks and within a geographic distance of 250 meters (Mohler et al., 2021). However, this study did not find any association of seizures with fatal overdose rates. Another study examined associations between illicit drug seizures and fatal overdoses involving stimulants in Ohio from 2014 to 2019 (Zibbell et al., 2022). Monthly seizures of methamphetamine and cocaine that also contained illicitly manufactured fentanyl were associated with more fatal overdoses; similar trends were not observed for seizures of stimulants without fentanyl.

Limited evidence on the role of drug enforcement activities in reducing fatal overdose rates has prompted some scholars to argue that harm reduction strategies to ensure safe supply, such as trusted relationships with drug dealers, may be important to curtailing fatal overdose risk in light of the increasing fentanyl presence in the drug supply (Carroll et al., 2020; Fleming et al., 2020; Ivsins et al., 2020). Others have argued the need for greater coordination across law enforcement and community agencies for supply control, primary prevention, secondary prevention, and direct support for people who use drugs (Strang et al., 2012). Still others argue that the inherent tension between supply and demand reduction strategies impedes efforts to achieve a uniform and effective approach to drug prevention (Werb, 2018).

The U.S. continues to invest heavily in supply-side enforcement. Yet, the overall body of evidence on the role of supply-level interventions on fatal overdoses is fairly limited. Many investigations pre-date the current fentanyl and polydrug use epidemic, which emerged in full force between 2015 and 2016 (Park et al., 2021). Prior studies primarily have examined effects of a single drug seizure on overdose outcomes or temporally linked repeated seizures and overdose outcomes. Few studies have examined the effects of drug seizures across local jurisdictions or controlled for known correlates of geographic variability in overdose outcomes. There has also been limited investigation of the role of higher-level drug enforcement mechanisms—such as disruption of drug trafficking or money laundering organizations (DTOs and MLOs)—on overdose outcomes, despite these being a central component of drug enforcement efforts (U.S. Department of Justice, 2021). Specifically, prior research shows local drug networks are organized primarily by substance with most DTOs

dealing one substance (Sterner et al., 2021), suggesting that disruption to organizational operations may have similar effects on drug availability as drug seizures.

Moreover, there is growing evidence of meaningful regional differences in drug supply across the U.S. Opioid use, in particular, is geographically distributed, with unique differences in use across urban and rural contexts (Peters et al., 2020). Furthermore, community-level socioeconomic and demographic characteristics are differentially associated with community-level trajectories of fatal overdose rates (Wagner et al., 2021). Finally, recent trends show that fentanyl and stimulant polysubstance use varies across geographic regions of the U.S. (O'Donnell et al., 2021). Illicitly manufactured fentanyl appears alone most often in overdose deaths in the western U.S., though this region is also more likely to see methamphetamine co-occur with fentanyl relative to other U.S. regions. Co-involved cocaine and fentanyl deaths are more likely to occur in the northeastern U.S., but also in the Midwest and south. The northeastern U.S. has shown fairly stable rates of fentanyl-involved overdose deaths in recent years whereas fentanyl-involved deaths are increasing in all other parts of the U.S. Together, these trends warrant research focus on regional trends in drug supply and drug overdose deaths.

Greater understanding of the role of supply reduction on the drug overdose epidemic may help inform federal funding priorities for drug enforcement and the broader importance of demand reduction efforts as part of U.S. drug policy. To advance research on the role of drug supply indicators on fatal overdose outcomes, we examined the role of drug enforcement activities on next-year fatal overdose rates over a 5-year period (2016–2020) across all 45 localities in the Washington/Baltimore High Intensity Drug Trafficking Area (W/B HIDTA). Our specific research objectives were to examine whether: 1) annual amounts of specific drugs seized predicted next-year fatal overdose rates; 2) the total number of drug seizures annually predicted next-year fatal overdose rates; and 3) whether disruptions to DTO and MLO activities predicted next-year fatal overdose rates.

Section snippets

Approach

We conducted mixed-effects models to examine predictive associations between county-level measures of drug supply and disruption and next-year fatal overdose rates over a 5-year period (2016–2020). Drawing on recent trends in polydrug use, we examined drug seizures in dosage units per capita for each of the following drug categories: cocaine, methamphetamine, fentanyl, prescription opioids, and heroin and other opioids. We also examined the percentage of drug trafficking organizations and money

Descriptive statistics

Across years, overall fatal overdose rates averaged 33.11 per 100,000 residents ($SD = 21.01$; Range: 7.93 to 112.10). Consistent with broader U.S. trends, fatal overdose rates were lowest in 2016 (29.85 deaths per 100,000 residents; $SD = 19.35$, Range: 0 to 84.60) and highest in 2020 ($M = 41.56$ deaths per 100,000 residents; $SD = 30.21$, Range: 0 to 144.80). Fig. 1 shows the geographic

distribution of fatal overdose death rates from 2016 to 2020. Opioid-involved fatal overdose rates ($M = 28.84$ per

Discussion

Many scholars argue the opioid epidemic has transformed into a supply-side overdose crisis characterized by high amounts of illicitly manufactured fentanyl in the U.S. drug supply (Fischer et al., 2020). Despite recognition of the critical role of drug supply in the current overdose crisis, there have been few empirical investigations of the effects of supply-side drug enforcement efforts on fatal overdose outcomes. To address this limitation, we examined the role of supply-side drug

Conclusion

Over a 5-year period and across 45 local jurisdictions in the W/B HIDTA, we found some evidence that supply-side interventions predicted next-year fatal overdose risk, namely, cocaine seizures relative to population size and the overall number of drug seizures. For both measures, significant associations were positive, suggesting more intensive drug enforcement activity served as a marker for higher numbers of next-year fatal overdoses. Overall, our findings suggest supply-side interventions

Ethics approval

This study was determined to be exempt from review by the University Institutional Review Board (IRB determination #1817896-1).

Declarations of Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

At the time of this study, Lora Peppard, Rebecca Bates, and Thomas Carr were employed with the Washington/Baltimore HIDTA. The authors report no other conflicts of interest.

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provided feedback on manuscript drafts. Dr. Lowder decided to submit the article for peer review with support from W/B HIDTA staff

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